

1 December 2011

To whom it may concern,

## **Preliminary Assessment of ART Turbine**

I have been collaborating over recent months with Drew Rokeby-Thomas, and wish to offer the following comments on the very interesting wind turbine which he is developing through his company ART Turbine Inc. on Salt Spring Island.

The ART turbine is a strikingly elegant vertical axis machine of the high torque low speed type. The aerodynamic design is quite advanced, promising significantly higher efficiency than prior art wind turbines of this category. In comparison with propeller type turbines, this device is silent, structurally robust and exceptionally simple. It is structurally more robust than prior art vertical axis turbines. Power take-off from the vertical axis hub is conveniently direct and versatile for electrical, mechanical or pumping loads. The design is well adapted to high volume low cost manufacturing, compensating for the inherent high solidity of the rotor.

I have worked extensively with diverse types of fluid machinery, and have previously assessed alternative concepts for both wind and tidal turbines. In considering the ART turbine, I have reviewed some of the prior art literature and patents. This development seems to have substantial novelty in its several advantageous features. The PCT international patent application for the ART turbine has received an entirely favourable search report.

Particularly promising wind power applications would include:

- Household power for rural and remote locations  
(simplicity, durability, low noise, aesthetic elegance)
- Power generation at mountaintop and exposed coastal sites with high turbulence  
(omnidirectionality, structural robustness, mechanical simplicity)
- Power generation for subarctic, arctic or Antarctic facilities  
(insensitivity to icing, extreme mechanical simplicity)
- Rooftop air conditioning and refrigeration loads  
(vertical shaft, low noise and vibration)
- Water pumping and reverse osmosis desalination loads  
(high torque, power takeoff at base)

The turbine is also promising for water power applications, particularly tidal currents. Its completely clean and uncluttered shape, along with relatively low blade speed, makes this turbine attractive for its resistance to entanglement or fouling, and lowest risk to fish and marine mammals.

An impressive demonstration of a prototype ART turbine was performed on the ridge just above us on Galiano Island. The machine in 1/3 kW nominal rating is very portable, easily erected by two people, and runs well in a light breeze. Its elegantly sinuous movement is a pleasure to watch, and will be a great attribute for future marketing.

Drew is a talented inventor with excellent skills in fluid mechanics, design and fabrication. He seems to be largely motivated by aesthetic values and practical idealism to do something significant for clean energy, sustainability and third world development. Drew has excellent entrepreneurial drive, with the demonstrated determination and guts to launch his project and carry it successfully to this stage with very limited resources. He has the maturity and wisdom to appreciate the need for senior management expertise to complement his own skills, and is willing to accept advice.

As a result of my own positive assessment of this entrepreneurial project and its promising turbine technology, I am personally committed to help Drew in moving forward with all ingredients coming together for a strongly focused and well-rounded business venture.

Sincerely,

A handwritten signature in black ink, reading "Bowie Keefer". The signature is fluid and cursive, with a long horizontal flourish at the end.

Bowie G. Keefer, Ph.D., P.Eng.

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